pplication of PIXE and PIGE under variable ion beam incident angle to everal fields of archaeometry†

. Weber[1,3,*], L. Martinot[1], D. Strivay[1,3], . P. Garnir[1,3], P. George[2]

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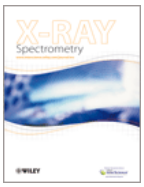
Issue



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Abstract

For several years, the specific features of PIXE and PIGE have made them very attractive in the field of archaeometry. Among them, non-destructivity is one of the most important. The possibility of working under atmospheric pressure is also important because of the very different shapes and sizes of the artefacts concerned. However, these ion beam techniques suffer from the same disadvantage: the information coming from x-rays or γ-rays produced at different places along the charged particle path is integrated. That prevents one from taking into account the possible element concentration gradients due to multi-layered systems or diffusion processes. This paper presents several applications of PIXE and PIGE applied under variable ion beam incident angle. PIGE has been mainly used for studying ancient glass items or glass windows in order to detect or evaluate the glass corrosion process. The examples given for PIGE deal with Roman and Merovingian glass objects and cathedral glass windows and PIXE applications concern studies for resolving the multilayered structure of easel paintings. The set-up allowing one to perform the measurements should be very stable, the rotation axis should pass through the beam axis and the detector should follow the sample movement. Copyright © 2005 John Wiley & Sons, Ltd.

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